

THEORY AND METODOLOGY OF MANAGEMENT

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THE SYSTEMIC APPROACH TO STRATEGIC MANAGEMENT AND CONSULTING; THE QUANTITATIVE MODEL OF SWOT ANALYSIS

Abstract. *This article describes an example of a systemic approach towards the analysis of social systems and the organizations or their components. The model of analysis is based on the consideration of system through relative properties of its elements. Since these properties are manifested only in the interaction, the state of the system can be described as a set of resource exchange processes and their parameters. Each component of the system is characterized in terms of its function. All participating members are described as external resources that support processes of an organization. The methods of research of system elements or its processes and resource sources involved are shown based on the SWOT analysis. The author describes the most effective strategies for all four types of processes (strengths, weaknesses, threats, and opportunities). The assignment of processes to a particular type is based on the relative features of interacting entities. It is stated that all subjects, with which a system or an organization interacts, are sources of useful resources. If there is a source of destructive influence on the organization processes, the system searches for external resources, extenuating this influence without connection thereto. It is implied that any exchange of energy takes place on the basis of mutual compensation. It is also shown that for a system any interaction is adaptation to a larger system, or a change of smaller systems for its own benefit. Hence, the result for the system will either be an accumulation of energy or investments. Finally, the author describes the algorithm for evaluation of any sources of resources for their assignment to one of the categories on the SWOT matrix. The rating is based on the relative value of the resource source and the relative probability of its emergence. The main instruments of the different strategies are accumulation, investments and an increase in turnover. Additionally, the possibility of using this instrument for assessment under the model of Porter's five forces is represented.*

Keywords: *social capital, symbolic capital, cenotypes of Ramensky, competition of Yudanov, systemic approach, marketing mix, Porter's five forces, SWOT analysis, strategic management, systems theory.*

Аннотация. *В настоящей статье описан пример системного подхода к анализу социальных систем, в первую очередь - организаций, либо их составляющих. Представлена модель анализа, основанная на изучении системы через относительные свойства ее элементов. Так как данные свойства проявляются только при взаимодействии, то состояние системы можно описать через комплекс процессов обмена ресурсами и их параметры. Каждый компонент системы описывается через его функции. Все участвующие элементы учитываются в качестве внешних источников ресурсов, поддерживающих процессы организации. Показан метод исследования элементов системы, или ее процессов и участвующих в них источников ресурсов, на основе SWOT-анализа. Для всех четырех типов процессов (угроз, возможностей, сильных/слабых сторон) описываются наиболее эффективные стратегии. Отнесение процессов к определенному типу производится на основе измерения относительных характеристик взаимодействующих субъектов. Утверждается, что все контрагенты, с которыми взаимодействует система или организация, являются источниками полезных ресурсов. При наличии источника разрушающего влияния на процессы организации, система не контактируя с ним ищет внешние ресурсы, ослабляющие это влияние. Подразумевается, что любой обмен энергией протекает на условиях взаимной компенсации. Также показано, что любое взаимодействие является для системы либо адаптацией к более крупной системе, либо изменением меньших систем для собственной выгоды. Отсюда, следствием для системы будет либо накопление энергии, либо инвестирование. В конце показан алгоритм оценки любых источников ресурсов с целью отнесения к одной из категорий по модели SWOT. Оценка производится на основе относительной значимости источника ресурсов и его относительной вероятности появления. Основными инструментами реализации стратегий являются накопление, инвестирование и увеличение интенсивности обмена. Дополнительно показана возможность использования представленного инструмента для оценки по модели пяти сил Портера.*

Ключевые слова: *маркетинг микс, системный подход, конкуренция по Юданову, ценотипы по Раменскому, SWOT-анализ, символический капитал, пять сил Портера, стратегическое управление, теория систем, социальный капитал*

Introduction

Systems theory is an effective tool and is often used in the management, primarily in strategic management and human resource management [1, 2, 3]. This article is an example of a systematic approach for multipurpose description of organization's structure as open self-sustaining system. Usually systems are described through their elements interacting with each other to achieve a common goal [4]. Such description is convenient in many, but not in all cases. If we consider that the organization consists of people - social systems, it may eventually completely change their stuff, owners, rules, goals, structure, etc., but it can be considered the same organization. We can draw an analogy to the famous paradox of the Theseus ship – Greek ship, which all planks were eventually replaced [5]. In such cases the definition of a system through the description of its individual elements may be misleading.

To avoid excessive concentration in the composition, the components of the system may be considered as "functional elements" [6], such definition, for instance, was used by V. Sagatovsky. Functions of elements appear in interaction, which means that we will proceed with the "functional relationship" between systems elements [7]. In this article, we will consider a system or an organization in accordance with one of the J. Klir's definitions of a system as a set of changes of specific variables over time. [8] We can say that a system is a set of processes [9]. This definition is useful, for example, for computer programs that can run on different devices, but with approximately constant algorithm. Considering an organization from this point of view, we can consider its employees on an equal basis with other service providers [10] to reduce the complexity of the system analysis.

Shifting attention from description of elements to description of process properties is not switching from the system approach to the process approach. The process approach addresses various subsets of processes as a whole, as well as their management [11]. In our case, we only use the relative dynamic properties of its elements for description of system states. System analysis is performed through the examination of interactions between elements. This interaction occurs through

the exchange of resources – matters, that contains energy or, what is equivalent, information [12, 13].

In addition to simple exchange it's possible to accumulate energy or information. In such cases flow of resources entering the system is gradually slowed down and passes through system partially. Complexity of an internal structure is temporarily increasing, which can be compared with an increase of enthalpy. For an organization this process is similar to the increase of stocks, many kinds of non-current resources or complexity of structure of an organization. Such structure is substantially inertial and can't change rapidly due to slow internal processes. In this case structure resists to temporary changes, which weaken its processes. This resistance is due to the stable output of energy flows which support interaction.

There is another case of lag in time of energy exchange process. It occurs when the energy, transferred between system elements or transmitted outside, will not be restored immediately by a response signal, and provides a response after some pause. Examples include some costs of future periods, running research departments or receiving accounts. Large number of pending processes makes the system more resilient to many external changes, due to the steady input flow of energy available to create new connections. However, if flow of energy and resources is invested in deferred external processes, the rest is not enough for slowdown in the internal processes. So, stocks and number of structure's hierarchical levels in such system will be less [14].

Lag in time of exchange process always assumes existence of at least one subject with slower internal processes and at least one subject which waits for deferred external impulses. In complex systems both types of deferred processes always occur in the different interaction channels, and exchange of various kinds of resources or energy happens. Moreover, accumulated resources also can often vary in type. In cases of interacting organizations the most common case is when one resource is in the financial form and other is the other kind.

An entity, which invests energy or resources in deferred process, has excess of resource. Consequently, subject which gets energy or

resources for storage in such moment, needs experience. In any interaction between two systems one of them is strengthened, and the other one is weakened. A system, which invests resources, gets external resources in the future and expands its borders. A system which accumulates energy, on the one hand, becomes more complicated, but at the same time a part of its processes is in favor of an external system, and own internal processes of such system are weakened. [15]

Entering processes of large super-systems is always associated with adaptation for them, so there are investments in the resources accumulation: fixed resources, stocks or other. At the same time spreading of effect on smaller systems is always performed by using of energy and resources investments in deferred profitable response signal. An adaptation to large super-system is not always profitless; it often can increase other flows of resources within the adapting system. Also, for example, large amount of receiving accounts is often useful, as it increases stability of a system in the future by a guaranteed flow of energy or resources. [16]

In this article it is assumed that any exchange of energy or resources between two systems takes place only as equal exchange. There may be cases, when it is required to return quantity of resources, which is different from the cost of provided resources, even after taking into account such components as the percentage of deferred payment. Then you need to consider a complex of processes of interaction with an entire set of same entities, or a sequence of interactions over time. A value may be higher due to the probability of termination, so that losses are included in the price, or a price may be lower, but then there are investments in the deferred processes, as for instance "dumping" when counterparties are adapted to processes of external system. Thus there is the equal exchange either with the entire set of counterparties or in the long term. Opportunistic or criminal behavior cases are implied as permanent risk, which is eliminated by additional services, i.e. by inclusion of additional entities.

Description of organization structure

Any real system is open, i.e. it exchanges information: energy and matter. Such interactions

help supporting system processes and resources. They include at least one of the interacting subjects, which always represent the system under consideration, and it is a transmitter of external signal into the system and internal signal out of it. Or transfer occurs between two system members. External energy is transferred to system internal interactions to support them.

In addition to resources, external factors can perform influence that destroys internal system processes by reducing their intensity or destroying communications. Such interactions can be dangerous, and the system should try to avoid them. Their algorithm is similar to other interactions: subject, which is a representative of an external "dangerous" system, exchanges signals with an entity, representing considered system or with a representative of its super-system. As a result, the subject, who had represented the considered system, becomes not available to transmit a signal anywhere else, including in its former system, considered by us. Separation of external signal sources to resources and dangers, which the system respectively seeks to obtain or avoid, is close to the separation of external processes of an organization on the defensive and offensive ones, used in Defensive/Offensive Evaluation model [17]. According to that, the resources, needed to minimize dangerous effects and resources for direct strengthening system processes, can be respectively divided into interactions, based on necessity, and interactions, based on the opportunity [18].

Systems do not interact with hazards. If there is an external destructive action, a system does not send a response. Instead of it, system finds an external resource interaction with reduce the impact of hazards, strengthening connections that were weakened. If such resource removes only part of a danger, the system needs another resource to eliminate the rest of negative impact. With these resources, the hazard characteristics that have been eliminated by them, are not important. Further actions of the system depend on the characteristics of relevant resources. If a portion of negative effects can't be eliminated, such effects will become a background and should be taken into account for calculating resource properties. Therefore the only external entities to interact with system are sources of resources.

Extra energy is always spent on establishing and optimization of interactions. So, losing existing connection is more expensive than not acquiring them [19]. In addition to subjects, providing opportunist or criminal behavior, systems communications are weakened by entities, competing for the same resources. For this reason among all of external super-systems, in which the system under consideration is included in, complex of competitive subjects should be considered first. This complex in case of people is called the society; in case of organizations it is called the branch. Direct competitors are the main external threat for both suppliers and consumers. In the Porter's five forces model available competitors are often placed in the center [20] due to resources, weakening competitor's impact, which are often the most urgent need. In addition to direct competitors within a branch, competing industry exists – such as substitute goods. They also represent a danger, violating established connections, but for an entire entities group in a branch, including the system under consideration. Possible enlargement of branch of super-system by a new direct competitor and an expansion of market of similar products by a new substitute were emphasized by Porter to individual forces which effect on organization activities. To eliminate these hazards, additional resources, increasing barriers to market entry, are required.

The next super-system, which is important for a system, is a super-system of resources sources - a super-system of suppliers and consumers. Firstly, let's consider interaction with suppliers. As mentioned above, organization's employees are considered as external suppliers and service providers. Interacting with them definitely has some features, such as many non-financial sorts of payment and inducement [21] as well as legal obligations. However, situations of non-financial relations with traditional suppliers are quite common. Moreover, there is fairly common situation of interaction with suppliers without the mediation of money at all, such as sponsorship contributions with goods or services. In such cases both entities are suppliers and consumers at the same time.

Consumption purposes are variable. If we talk about individuals, they can purchase goods for specific need or for creating and maintaining a certain status [22] i.e. the conspicuous consumption

[23]. For organizations the accumulation of some resources indirectly involved in basic processes may be considered as an analog of the conspicuous consumption. This accumulation corresponds to adaptation to a relevant global super-system [24]. Such adaptation can simplify interaction with some external entities due to the mediation of this global super-system. Examples of such products are certification services, purchasing foreign currency, hiring well-known experts for image projects or the purchase of decorative interior items. For social systems these products are associated with the symbolic capital [25] due to the fact that their main cost does not correspond to their internal energy, but corresponds to information broadcasted through them. Such products are evaluated by the consumer in accordance to general rules, i.e. consumer checks accordance of goods to the adaptation parameters, which he/she has accepted for joining the global super-system.

As for products, consumed strictly for utilitarian purpose, their consumption can be divided into two types: one-time and periodically. The ad hoc consumption is either accidental, or due to some incident, or for solutions of permanent issue. Such product requires a long period of time and its use is the accumulation of technological capital. Typically for organizations such products are an essential part of non-current resources. Symbolic and technological capital of systems shows interaction with the global super-systems. The most dynamic of them are political, economic, social and technological ones [26], as well as the legal system and the environment [27].

If the demand for the product or service occurs on a regular basis, it is assumed to be ongoing relationship with a supplier, and in such cases characteristics of the counterparty and parameters of interaction with it are more important than characteristics of a product itself. In social systems it reflects the relationship marketing [28] based on social capital [29]. Social capital is the inverse of the symbolic one and does not associate to adapting to external information super-systems but corresponds to an adaptation of the counterparty to own information system. For example, the more information about the product or the company has accumulated by a customer or a supplier, the more energy they will return to the information source. So investment in changing information, stored by the

contractor, is also a deferred process of a response signal, i.e. accumulation of social capital is not the accumulation of energy in own deferred processes, but it corresponds to the energy investing in deferred processes of counterparties.

There is only a few number of products required for accumulation of one from the technical, social and symbolic capitals. In analysis of each root of resources they should be considered as several resources with individual properties. In practice, if a value of any parameter is not significant and if it is linked to the small flows of information, it is estimated by matching the formal criteria of common super-systems for simplification [30].

For an organization as a system, the suppliers and the consumers differ in cash flows direction, but all of them are sources of several resources, one of which is cash. Moreover, as already mentioned above, it is possible to interact with suppliers without using money. Such interaction is also possible with consumers. In some cases suppliers and consumers may be almost the same group. For example, in case of mobile applications, available in both free and paid versions, when the difference between versions is the presence of advertising. In these examples, the free version users are suppliers of advertising audience in exchange for software, and the users of the paid version of the software are consumers with cash payment. In cases of global social systems, as states, suppliers and consumers completely merge into the one group of citizens. Cooperation with them is carried out through numerous subsystems, primarily through various organizations. Citizens are the source of the country's main resource, people, and they are also the main consumers of the living conditions in the country.

If we consider money as one of the goods available for exchange, then the suppliers and consumers of any organization are functionally equivalent. In this approach the value chain is a sequence of energy or information streams supporting processes of a system. So cash flows or changes of stored energy in other forms are the acts of increase or decrease of the stored internal energy, i.e. enthalpy or weight. The goods or services consumed by the organization in consideration are input signals from suppliers in response to the output signal. Supplied goods and provided services

are output signals to customers in response to the input signal of payment.

For each type of goods four parameters are important in all acts of interaction. These parameters are described in the Marketing Mix model: price, product, promotion, and placement [31]. "Product" and "Price" show what resources are exchanged between the counterparties. "Placement" shows, what additional resources are used to enhance the interaction intensity. "Promotion" describes what additional resources are attracted for consumers adaptation, and thus to enhance the pending processes.

Analysis of resource sources

The analysis of resource, energy or information flows relatively to the system in question is supposed to be produced by two relative parameters. The first is the average value of a single resources source for a given set of processes. The second key parameter is the probability of interaction with sources of particular type [32] during a complex of processes.

An average value of a single source of some type of resources is estimated relative to need for this resource for maintaining of the complex of process; in other words, it is estimated relative to magnitude P_d of all energy or information, flown through all such sources within the complex of processes. The average value of a single source is the amount of energy or information P_s , flown through each individual source of this resource. For company analysis it's convenient to take these values in financial terms.

The probability of interaction with the source of resources during the length of the complex of process is calculated as the product of two factors. One of them is the frequency v_s of appearance of the resource sources in time, which corresponds to the probability of their appearance. Another factor is the duration of the production cycle under consideration or the production complex of processes - T_d .

Product of significance of external resources sources P_s/P_d and probability of interaction with them during production cycle $v_s \cdot T_d$ shows value of provision of considered complex of processes by given resource $O_s = v_s \cdot T_d \cdot P_s/P_d$. Presence or absence

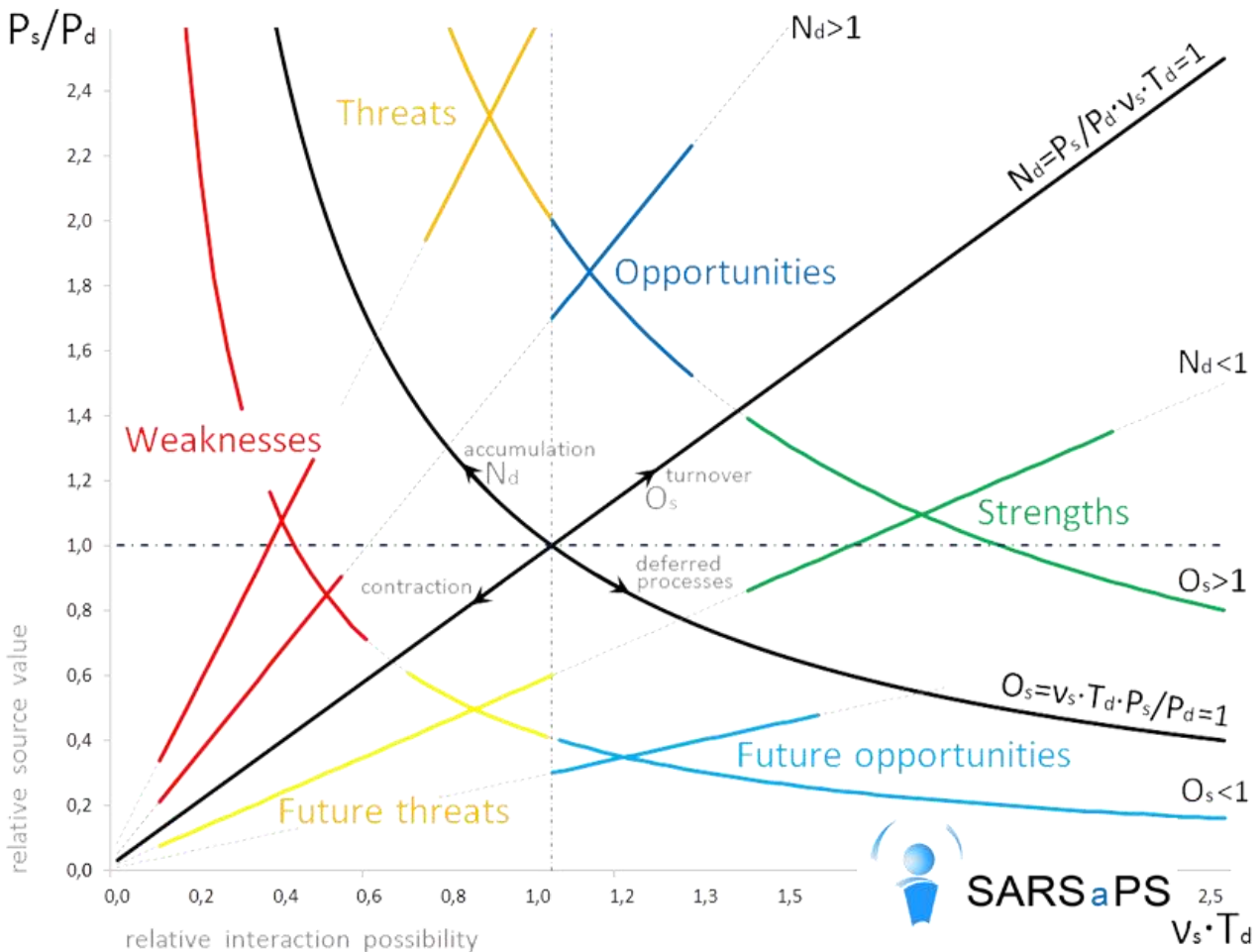


Fig 1. Types of interaction with resource sources

of opportunity of accumulation of obtained energy depends on this factor. If $O_s > 1$, then processes are fully provided with resources, and surpluses can be used for other goals. If $O_s < 1$, then system has deficit. Border between states of surplus and deficit is hyperbola in coordinates of relative significance of resource's source P_s/P_d and relative probability of its appearance $v_s \cdot T_d$.

If we divide P_s/P_d by value $v_s \cdot T_d$, then we obtain factor $N_d = P_s/P_d \cdot v_s \cdot T_d$, which can be used for regression analysis of influence of these two factors in providing of considered processes. When there is deficit, i.e. $O_s < 1$, we need to define which factor's shortage is more expressed – $v_s \cdot T_d$ or P_s/P_d . If $O_s < 1$ and $N_d < 1$, then small probability of interaction with resource's source is the main cause of deficit. If $O_s < 1$ and $N_d > 1$, then the main cause of poor supply is small energy of resource's sources.

When supplying of production line by some resource is surplus, $O_d > 1$, then $N_d < 1$ means that surplus is mainly appeared thanks to high

probability of interaction with source. In this situation $N_d > 1$ would alert about larger influence of resource's energy surplus.

One can say that value $O_s > 1$ means opportunity of accumulation and about its value, and coefficient $N_d > 1$ is factor of accumulation necessity and its importance. For illustration let's show these factors on the plot with axes P_s/P_d and $v_s \cdot T_d$. Intersection of hyperbola $O_s = 1$ and straight line $N_d = 1$ divides plot into four parts. Difference between sources of resources, corresponding to these areas, is the following: sources with significant accumulation necessity, but small opportunity; sources with significant accumulation necessity and significant opportunity for it; sources with low accumulation necessity and small opportunity; and the last type – sources with low accumulation necessity, but significant opportunity.

Characteristics of environment, external resource sources have an impact on character of activity of systems, existing in such medium.

Consequently, if we define relative characteristics of all external subjects and create for each of them above-described plot, we will be able to determine optimal strategy of systems while interacting with existing contractors. For strategic planning specialist often use SWOT model (Strengths, Opportunities (we will use the term "potential" to avoid different use of term "opportunity"), Weaknesses, and Threats) [33, 34]. These factors are sometimes divided into internal: weak and strong sides, and external: threats and potential [35]. Most times specialists use for quantitative SWOT analysis points system of expert evaluation [36]. In our model all resources sources are external ones, so they can be classified as resource of any type. We will try to draw an analogy with SWOT model while analyzing possible strategy.

To elaborate strategy of interaction with specific external resource source, we need to draw on the plot with previously drawn lines $O_s=1$ and $N_d=1$ new lines N_d and O_s , corresponding to given source, and determine point of their intersection. Type of source in SWOT model can be determined based on their position relative to unit lines and straight line $v_s \cdot T_d=1$.

In some cases it is convenient to turn given plot through 45 degrees, so axis will be lines $N_d=1$ and $O_s=1$, as well as one can conditionally represent the last one as straight line. For example, similar plot for evaluation of consumers' resources is actually used in model of analysis Boston box, where axis of marker's growth corresponds to necessity of increasing customer base for conserving share, and available market share characterize opportunities for attracting clients [37].

Let's consider possible cases more thoroughly. Under given value of opportunity of energy accumulation O_s , value of demand for energy accumulation N_d relative to value of O_s shows, how independent considered system is and what share of its free resources is. Value P_s/P_d shows size of flows of given resource in considered system in comparison to flows of resource through its individual contactors of available type. We also can evaluate comparative opportunity of mutual influence.

The larger power of interaction processes, the tighter relation, and, consequently, the more stable general system [38]. Though, power of each

new cycle of processes complex either grows or decreases. In other words, system either develops or reduces. Parameter $v_s \cdot T_d$ shows current dynamics. If $v_s \cdot T_d < 1$, resources are not sufficient to support current or deferred processes, in this case part of them ceases to exist, and instead of growth we watch reducing of system's borders. If $v_s \cdot T_d > 1$, there are excessive flows of energy either in current or deferred processes, which can create new processes, passing through the system. In this case we will watch system development.

Supposed parameters N_d and O_s give six possible combinations, which are graphically represented on picture 1:

1) $O_s > 1$, $O_s > N_d$, $N_d < 1$ – in this case system has large flow of resources, demands of which is less than their income. Such resources sources increase a competitive advantage, that's why it is possible to draw an analogy to strong sides of an organization (strengths) in SWOT model [39]. System's main strategy in such case is supporting and improving such interaction. It has two ways of doing it; first one is increasing energy flows at the current moment, i.e. frequencies of interaction with external resources sources. In this case current volume of energy flow increases. Actually, such actions are expressed in searching of additional subcontractors for attracting target subjects or increasing their income. Second strategy is using resources for improving energy flows in the future to increase influence on contractors. For example, start of preparing new products or markets is possible. Both ways of improving interaction, increasing and improving deferred processes, are aimed at shifting plot point, characterizing source of resources, to the right. However, these two strategies shift characteristics on plot vertically too – increasing volume shifts it upward, investments in deferred processes - downward.

Line $P_s/P_d=1$ shows which strategy is more effective. If point is lower than this line – investments into deferred processes are more effective, if point is higher – investments into increasing volume. In first case relation is more suitable for adaptation by redirecting current energy flows. In second case – interaction with resource source are distributed over time contains deferred signals and is more resistant to temporary change. If mobility is more preferable, you should look for shifting position of point of resource's source higher

relative to line $P_s/P_d=1$ by means of increasing volume. But in this case risk of shifting over the line $N_d=1$, while changing environment, increases. If stability is preferable, then target area lays beneath $P_s/P_d=1$. However, in last case risk of lack of resources availability for adaptation while changing environment and risk of shifting lower to line $O_s=1$ increases. Compromise is saving characteristics of resource source on the level $P_s/P_d=1$, and for this reason - uniform increasing of current and future processes.

2) $N_d>1$, $N_d>O_s$, $O_s<1$ – such factors characterize situation, completely contrary to the first one. Resources are required, but there is no income. In such cases system processes, where considered contractors participate, weaken. Weakening of volume and deferred processes happen. Latter happens because of instead of investments into future stability, in this case value of accumulated energy increases. This situation can be characterized as weak side of organization's activities (weakness), as it means not only increasing dependence on larger super-system and adaptation to them, but also weakening of system processes. Example of resource sources of such type can be loan, secured by large share of property or entrepreneur services towards system of own business.

Besides "freezing" resources in slow processes, there is the second factor, characterizing weak sides of system processes. As $N_d>1$, there is unfilled demand for resources. In cases of entry of weak resource flows for supporting activity, it is necessary to use them as much as possible in the most important subprocesses. Less prioritized processes, which do not have enough resources, cease. Actually, reducing of use of incoming energy in system processes happen, i.e. economy of resources. Such adaptation mechanisms are contrary to increasing volume.

There are two possible ways of escaping from such dependent situation of reducing system. First one is additional investments into deferred processes. Then characteristics of interaction with this resource source will change in future, their point on the plot will shift below the line $N_d=1$. Second possible strategy of changing interaction is additional investments into increasing volume to shift relative source parameters above line $O_s=1$.

Key parameter for choosing one of two strategies is significance of resource relative to level $P_s/P_d=1$. In case of $P_s/P_d>1$ it is more effective to use increasing volume, otherwise – increasing investments into deferred revenue.

3) $O_s>1$, $O_s<N_d$, $N_d>1$ – such factors show necessity of reserves, exceeding accumulation capabilities. At the same time, in interaction with resource source high volume dominate over economy. It allows accumulation to dominate over investments into deferred revenues. More than that, value of "frozen" resources exceeds value of volume. Such situation corresponds to threats in SWOT-analysis model [40]. There is a risk of turning into weak side of activity in temporary negative conditions, during short-term weakening of relation with source of given resource. But if resource source is stable, this situation is quite stable and profitable. The most effective way to decrease probability of losing stability during weakening of source is additional investments into increasing volume. Offered strategy aims at moving away from the line $O_s=1$. A little different strategy is improving interaction by simultaneous increasing of volume and exceeding of future expenses over accumulation. Such strategy aims at intersection of line $v_s \cdot T_d=1$ to obtain volume exceeding value of accumulated energy.

4) $O_s>1$, $O_s>N_d$, $N_d>1$ – opportunities of accumulation exceed necessity of accumulations. As was mentioned above, such factors mean excess of volume over value of "frozen" resources. But value of investments into deferred flows of energy is less than values of slow accumulation processes. Such interaction with resource source is also quite susceptible to temporary losses of interaction energy. However, value of volume in most cases allows redirecting energy for adaptation to new conditions. It means that there is some potential (opportunity) for saving system processes while weakening resource source.

The most efficient way to save and increase opportunity for adaptation is increasing volumes of system processes, using this resource. If temporary stability is more preferable, then it is effective way to increase share of investments into the future flows of energy relative to slow processes. Such actions will lead to intersection of line $N_d=1$ and turning considered resource source into strong side of an organization.

5) $O_s < 1$, $O_s < N_d$, $N_d < 1$ – upon such factors we will watch both absence of accumulations necessity and opportunities. Herewith, value of lost energy during decreasing activity is more than investments into deferred processes. Such state of interaction with resource source can be compared to trustless investments. Such situation contains increasing need in accumulations, which speed of growth is more than speed of growth of accumulations opportunities. However, summary negative is significant. It appears that threats to the system are also situated in this area of plot. Such threats differ from above considered short-term threats by longer saving of unprofitable activity. We can call them future threats. In case of presence of resources with such factors system's stability can be increased by enlarging volume of deferred energy flows. The most effective way is simultaneous improving interaction with contractors by both parameters.

6) $O_s < 1$, $O_s > N_d$, $N_d < 1$ – remaining area of plot is characterized by absence of accumulations needs and opportunities, but differs from the future threats by larger value of investments into deferred revenues relative to economy's value. Such relationships are more stable over time and related to slow smooth progress of processes. They can be characterized as future opportunities.

Conclusions

We considered all types of interaction with resource sources. There are six general types of interactions. We can additionally divide strong and weak sides into component relative to level of P_s/P_d , where the most effective strategy will be different. Eventually we can consider eight main types of interaction with contractors. In each case there is opportunity to save existing characteristics or change them. Effectivity and complexity of changing parameters of exchanging resources with contractors depends on mutual position of current and desired area on plot. The further the shift, the more complex its performance.

In real life conducting accurate calculation of relative probabilities of appearing resource source and its significance is quite difficult, that's why during calculation it is convenient to apply mathematical tools based on fuzzy logic.

Such analysis can be of different scale – we can conduct analysis of all an organization. Whereby consumers can be considered as united group of suppliers and perform calculations based on average factors. We can divide them into groups, for example, by production type. In this case analysis will be more accurate, and it will be possible to elaborate interaction strategy for each group more objectively. It is also possible to change scale of study of interaction with suppliers of other resources: labor, other services, materials and components etc. Besides an organization we can consider the production cycle of the individual products or their whole group. Likewise we can consider subcomplex of processes of the individual subdivision of the organization. We can also consider larger social systems. Presented analysis with little changes is applicable to the extreme cases of social systems – to individual persons and large countries.

If we consider systems theory in the broader terms, then two cases of interactions: $O_s > 1$, $O_s > N_d$, $N_d > 1$ and $O_s > 1$, $O_s < N_d$, $N_d > 1$ correspond to two contrary strategies of reproducing live organisms for the species system. First one corresponds to high frequency of reproducing with little resources accumulation in descendants. Second one corresponds to significant amount of accumulated energy in descendants and little number of them [41, 42]. In both cases the adaptation of the system for environmental conditions in different degree takes place.

In systems theory plants are very convenient for observing, because they receive resources by few number of canals. Stated by L.G. Ramenski strategies «violents», «explorants» and «patients» [43] are sometimes applied for the organizations [44]. «Violents» usually constantly develop and grow, they invest surplus of resources into larger receiving resources in the future, the parameters of its interaction with resources are $O_s < 1$, $O_s > N_d$, $N_d < 1$. «Explorants» exist in conditions of temporary surplus of resources, and that's why characteristics of interaction with resource sources are the following: $O_s > 1$, $O_s > N_d$, $N_d < 1$. «Patients» have high level of resources accumulations, which corresponds to relationships $O_s > 1$, $O_s < N_d$, $N_d > 1$. Sometimes these three types of strategies are completed by one more – «commutants» strategy [45], which is usually determined by high volume of resources

exchange and relatively small accumulations. For «commutants» the parameters are the following: $O_s > 1$, $O_s > N_d$, $N_d > 1$.

Results of analysis of processes in an organization as system are used in following way. When system has weak sides and if they are not eliminated, the complex of processes inevitably stops. As for the rest, it is desired that value of resources accumulation O_s is roughly equal for each participating resource. Resource, which source in given complex of processes is characterized by the least value of parameter O_s , is the "bottle neck", which limits flows of energy. For system, suffering from lack of several resources, it is profitable to concentrate on the most deficit one [46]. Additional resources should be primarily invested into interaction with given resource source. If value O_d significantly exceeds other sources, there is an unused opportunity, which should be reduced by refusing some sub-contractors. So, the nearer characteristics of resources, the fewer number of risks in process using them. Therefore, putting all processes to united parameters is optimal way. The most economical way is normalizing by type of interaction of most contractors. Thereat, changing type of interaction between two distant areas on our plot is possible only through intermediate stages [47].

Necessity of adaptation for larger super-systems means their significant marker power. If we talk about resource sources, aimed at decreasing external dangers, then their properties will denote properties of corresponding danger. For example, high necessity of development of new products upon low opportunity shows high probability of appearance of competitive goods either in this or related industries. Another example – low necessity of supporting clients' loyalty upon large opportunities – shows low probability of their switching to competitive goods. Same goes for other dangers, including illegal or opportunistic actions.

We can draw an analogy between introduced analysis model and models of calculating optimal accumulations level, Wilson model [48] for goods accumulations level and Baumol-Tobin model [49] for level of free money accumulation. In these models two relationships are considered: relationship of cost of replenishment operations and volume of replenishment and relationship of storage cost and volume of accumulations. These relationships well correlate to parameters of necessity N_d and accumulation opportunity O_s in presented model. The larger accumulation necessity, the more dependent position of considered system and the higher necessity to adapt. If system has opportunities to influence on its contractors, adapting them due to its needs, as a result of weaknesses of their processes, then accumulations necessity is minimal and system's organization opportunity appears, like "lean production" model [50]. But such way of organization is profitable only in case of large system and small resource sources. Situations of interaction of systems with approximately equal energies are also possible; in these cases relation periodically changes characteristics from threat to opportunity, for each of given subjects.

Model of organizational processes' system analysis draws full picture of its dynamic states, or all its processes of interaction with resource sources and its properties. Model includes traditional instrument of analysis, such as SWOT, Porter five forces, marketing mix, united by general system approach. Suggested approach to using traditional instruments of analysis allows obtaining clearer and more objective picture of organizational process. This approach allows more accurate evaluation of activity's effectivity and making suggestions about possible changes or its effect.

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